



A.D. 1856 N^o 932.

S P E C I F I C A T I O N

OF

JULIUS JEFFREYS.

RESPIRATORS.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 9d.

1856.



A.D. 1856 N° 932.

Respirators.

LETTERS PATENT to Julius Jeffreys, of Kingston Hill, in the County of Surrey, for the Invention of “**IMPROVEMENTS IN INSTRUMENTS FOR AIDING RESPIRATION.**”

Sealed the 17th October 1856, and dated the 18th April 1856.

PROVISIONAL SPECIFICATION left by the said Julius Jeffreys at the Office of the Commissioners of Patents, with his Petition, on the 18th April 1856.

I, JULIUS JEFFREYS, of Kingston Hill, in the County of Surrey, do hereby
5 declare the nature of the Invention for “**IMPROVEMENTS IN INSTRUMENTS FOR AIDING RESPIRATION,**” to be as follows:—

My improvements consist in new constructions for the instrument for which I introduced the name respirator.

First, I employ for the metal fabric of the operative part of the instrument
10 flattened spiral coils of wire, between the coils of which the currents of the breath pass transversely; by this simple structure all horizontal bars or wires arresting the descent of moisture may be avoided.

Secondly, I render the warming power of the instrument variable in every degree desirable, not by varying the number of layers, as hitherto, but by
15 rendering variable at will the distances between the parallel wires themselves of

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each layer (whether made of the above coiled fabric or otherwise), so as to allow the currents of the breath to escape with varying degrees of freedom between the wires. Where perforated metal plates are employed, I effect the object of varying the apertures, by causing the plates to slide over each other, so as to close or open the apertures. 5

Thirdly, in the form of respirator patented by me in 1850, in which the currents of breath are made to traverse longitudinally through the courses of metal, and parallel to their direction instead of transversely. I employ cylindrical or flattened coils of wire, plain or twisted, and known as "bullion," to form flexible tubular passages along the hollow spaces of which the currents 10 pass.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Julius Jeffreys in the Great Seal Patent Office on the 18th October 1856.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JULIUS 15
JEFFREYS, of Kingston Hill, in the County of Surrey, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eighteenth day of April, in the year of our Lord One thousand eight hundred and fifty-six, in the nineteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the 20 said Julius Jeffreys, Her special licence that I, the said Julius Jeffreys, my executors, administrators, and assigns, or such others as I, the said Julius Jeffreys, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, 25 and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN INSTRUMENTS FOR AIDING RESPIRATION," upon the condition (amongst others) that I, the said Julius Jeffreys, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, 30 should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Julius Jeffreys, do hereby declare the 35 nature of the said Invention, and in what manner the same is to be per-

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formed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

My improvements consist in new constructions for the instrument for which I introduced the name “respirator.”

5 First, I employ for the metal fabric of the operative part of the instrument flattened spiral coils of wire, between the coils of which the currents of the breath pass transversely; by this simple structure all horizontal bars or wires arresting the descent of moisture may be avoided.

Secondly, I render the warming power of the instrument variable in every
10 degree desirable, not by varying the number of layers, as hitherto, but by rendering variable at will the distances between the parallel wires themselves of each layer (whether made of the above coiled fabric or otherwise), so as to allow the currents of the breath to escape with varying degrees of freedom between the wires. Where perforated metal plates are employed, I effect the
15 object of varying the apertures, by causing the plates to slide over each other, so as to close or open the apertures.

Thirdly, in the form of respirator patented by me in 1850, in which the currents of breath are made to traverse longitudinally through the courses of metal, and parallel to their direction instead of transversely. I employ cylin-
20 drical or flattened coils of wire, plain or twisted, and known as “bullion,” to form flexible tubular passages along the hollow spaces of which the currents pass.

Figures 1, 2, 3, 4, and 5 represent the metal frame and operative metal work of a respirator of the first kind included in the above Provisional Speci-
25 fication. B, B, B, B, is an oblong plate of metal, seen flat in Figures 1, 2, 3, and 4, and having its central portion *b, b, b, b*, Figures 3 and 4, (which Figures shew the side next the mouth of the wearer) perforated into a “lattice,” and its upper and lower edges *L, L, L, L*, bent forwards into flanges, seen in Figure 5, which are notched, to admit of the plate B, B, being arched and fitted with
30 soft lip-tucks *H, H*, of jean or other fabric, into a mouth frame. In front of this mouth frame and in the recess formed between the flanged edges *L, L, L, L*, lies the operative metal work *C, C, C, C*, Figures 1, 2, 3, and 4, formed of continuous and very flat coils or skeins of wire, each forming two layers (about a fiftieth of an inch apart) of parallel lines, which at their upper and
35 lower bends *e, e, e, e*, Figures 1 and 2, are sewn to an elastic wire “bullion” or web. This elastic edging *e, e, e, e*, when allowed to shrink, as in Figure 2, keeps the lines of wire almost touching each other, and the whole packet of metal work contracted to the length *C, C, C, C*, which is the front aspect. The metal work then just covers the latticed or perforated portion *b, b, b, b*, of the

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mouth frame B, B, B, B, Figure 4, which is the back aspect, or that next the mouth of the wearer. The whole packet of wirework, which consists of several of the flat coils or skeins, does then occupy the perforated space or field of action of the mouth frame; the instrument is then at its greatest power. To reduce the power, a leathern thong D is attached firmly to a bar at 5 each end of the metal work C, C, C, C. These thongs D, D, have several pairs of holes *f, f, f, f*, a small distance apart, and the frame B, B, has at each end of it pins *i, i, i, i*, on a line with the holes *f, f*, in the thongs. The middle of the packet C, C, being secured to the middle of the mouth frame B, B, above and below at *k, k*, the thongs at each end are pulled length- 10 ways and fixed on the points *i, i, i, i*, passed through a pair of the holes *f, f*. Figure 1 shows the thongs drawn apart to the utmost and lodged on the pins by the last pair of holes. The instrument is then at its lowest power, for not only is half of the operative wirework by the stretching of the elastic edges *e, e, e, e*, drawn away from the field of action *b, b, b, b*, Figure 3, and hidden 15 behind the wings of the mouth frame B, B, but the distance between each line of wire is quadrupled, so as to allow much of the air of each current of the breath to pass through the metal work unaffected by it.

By this construction of a respirator, a person wearing it in a frosty atmosphere can, even without removing it from his face, vary the power of his 20 instrument in several different degrees, ranging, when the outer air is at, say, 30° of Fahrenheit, from 45° to 75°; and when the temperature of the air varies greatly, as from 25° to 55°, he can command, by simply adjusting the power of the instrument accordingly, an equable climate of any temperature he pleases 25 as from 60° to 70°.

The formation of the flattened coils (of which several placed over each other form the "packet" or operative metal work) is shown in Figure 8, where C, C, represents an exaggerated expansion of the coil, showing it to consist of a single wire, commencing at F and ending at G, coiled or bent sharply over, above, and below at *e, e, e, e*, &c., along which points the coil is attached to an 30 elastic substance (as already described in Figures 1 and 2) when the coil is to be expanded or contracted laterally. But when the distance between the several longitudinal lines of the coil is fixed, as in the following instrument, stout wires A, B, Figure 8, are passed through the coil above and below, and all the points or bends of the coil *e, e, e, e*, &c. are soldered to these 35 stout wires.

For carrying out with best effect the form of respirator described in the Provisional Specification as frames of metal with gratings or bars sliding over each other so as to vary the size of the apertures, coils of wire *c, c*, Figure 8,

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are made precisely similar to C, C, and soldered at the top and bottom-bends *e, e, e, e*, to wires *a, b*; but the coil *c, c*, is sufficiently less than C, C¹, in height and thickness to admit of its being slid completely within the latter coil until the points A and *a*, B and *b* are contiguous. In the Figure the coil *c, c*, is
5 shewn partially introduced into C, C. When it is in situ it is plain that by a slight lateral movement of the inner coil its bars or lines of wire may be made either to fall behind those of the containing coil C, C, so as to leave the apertures or slits between the vertical lines of the coils open, or the bars of the inner coil *c, c*, may lie in the way of the slits, so as to reduce them greatly in
10 width and to double their number. When the coils thus intercept each other's spaces, the currents of the breath passing through them are subjected to a greatly increased conductive action, and the power of the instrument is proportionably increased. By placing several of these double coils of wire together a complete operative "packet" of metal work is formed, of which Figure 9
15 presents an end view. Figure 10 is a slide movement for adjusting all the contained coils *c, c*, &c. of the "packet." I, I, is a plate of metal, attached along its ends to all the stout wire ends *b, b*, (cut short) of the contained coils *c, c*, of the packet. H, H, is a plate, the stapled ends *h, h, h, h*, of which enclose I, I, and are fixed on the stout wire ends B, B, of all the containing
20 coils C, C, of the packet. The thumb screw L passes through the screw nut M in H, H, and turns in a swivel joint N in the plate I, I. By turning the screw L the plate I, I, is made to draw or push all the contained coils *c, c*, laterally within their several containing coils C, C, so as to produce the effect of varying the power of the instrument, as above described. In place of the
25 arrangement of wires, Figures 8 and 9, perforated metal plates may be employed to slide one on the other to accomplish the like object.

Figures 6 and 7 represent the operative part of another form of respirator to be worn like a shawl wrapper, Figure 7 being a vertical transverse section of Figure 6 along the line *a¹, d¹*. In Figure 6 the shield B, B, is not shown.
30 A, A, A, A, are a series of parallel tubes, about twenty in a row, and four rows deep from front to back at top, but below spread out like a fan, so as to be of forty in the row, and two rows deep, the rows interlaying. Each of the tubes is a cylindrical or somewhat flattened spiral of fine wire, like the article made by gold fringe makers "bullion" or "pearl." In this instrument the currents
35 of the breath pass longitudinally through the tubes of the coils, the exhaled currents entering the upper orifices of the tubes *a, a*, and passing out at the lower orifices *d, d*, and the inhaled current entering at *d, d*, and passing out of the tubes at *a, a*, and thence into the mouth of the wearer, the pad *b* resting against his upper lip and the cloth lining at C¹ against his lower lip. B, B,

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Figure 7, is an arched plate of metal, which screens the mouth and gives direction to the currents. C, C, C, C, are sections of the inner and outer layers of the shawl wrapper, containing the operative work, but lined next the metal work over the front and back surface with an air-proof tissue, the lower orifices *d, d*, of the tubes being freely open to the atmosphere for easy 5 respiration.

In this construction of respirator the power is not variable, nor is it otherwise equal to the above, but it lies so flatly on the mouth, and from the flexibility of the tubes has so nearly the flexibility of a shawl wrapper, as not to be distinguished from it. 10

In witness whereof, I, the said Julius Jeffreys, have hereunto set my hand and seal, this Seventeenth day of October, in the year of our Lord One thousand eight hundred and fifty-six.

JULIUS JEFFREYS. (L.S.)

Witness,

G. HASELDEN.

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Printers to the Queen's most Excellent Majesty. 1856.

F I C . 3 .



F I C . 4 .

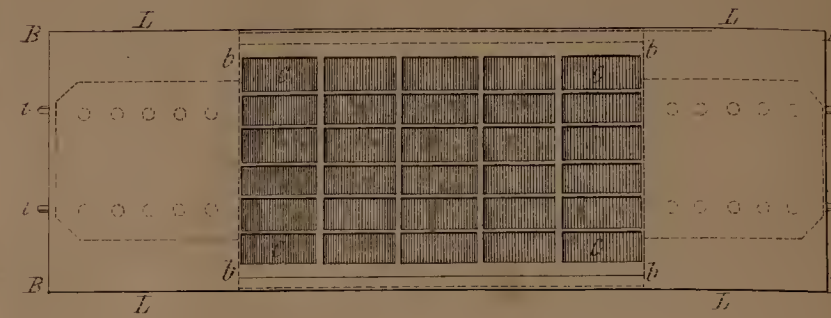


FIG. 6.

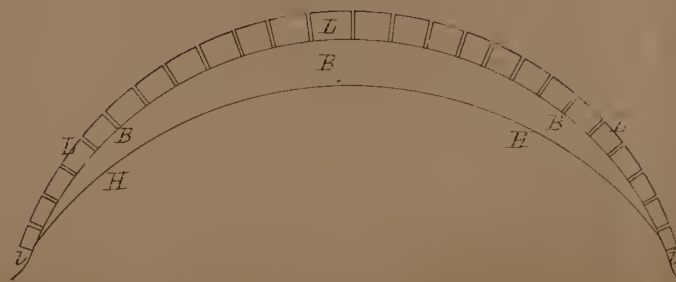


FIG. 6.

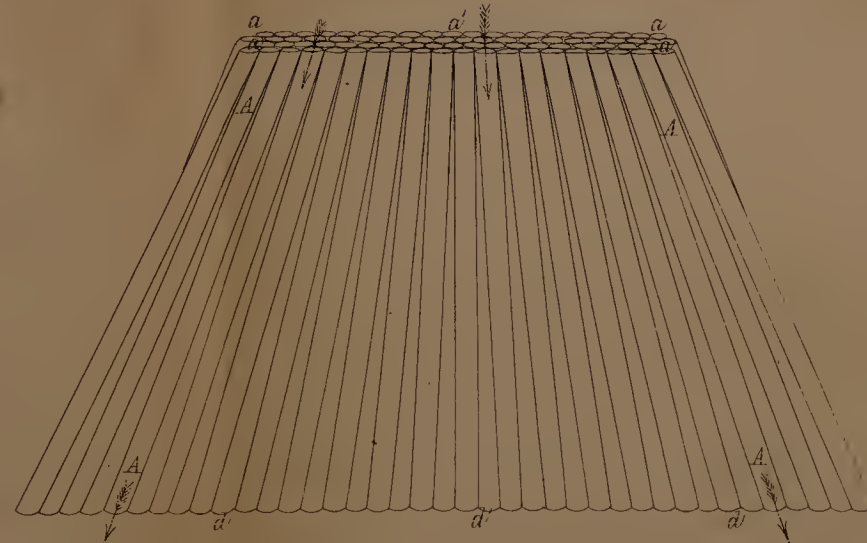


FIG. 7.



FIG. 8.

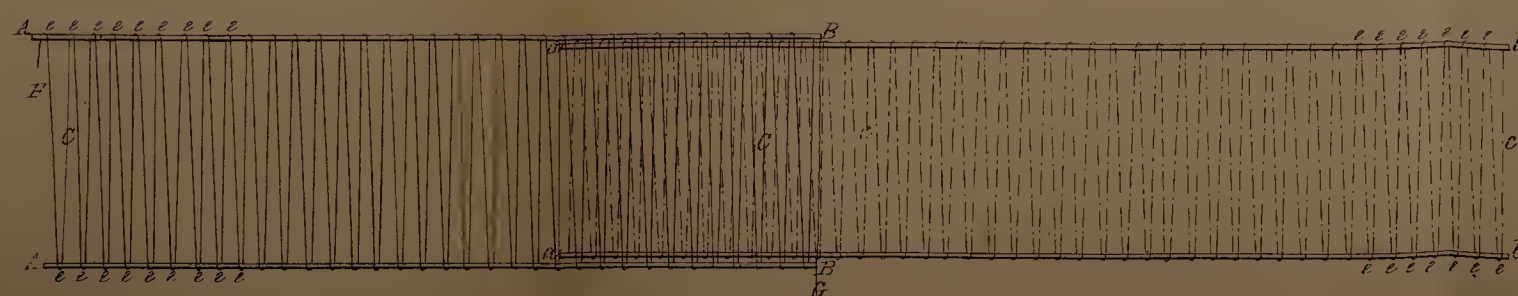


FIG. 9.



FIG. 10.

